

Stories of **EUGENE,** the Earthworm

Learning and Teaching
Vermiculture in Baguio City

By the Baguio Vermi Growers

Published by:

With support from:



Stories of Eugene, the Earthworm

Learning and Teaching Vermiculture in Baguio City

Copyright © Tebtebba Foundation 2012

All rights reserved.

No part of this book may be reproduced in any form or by any means without the written permission of the copyright owner and the publisher.

The views expressed by the writers do not necessarily reflect those of the publisher.

Published by

Tebtebba Foundation

No. 1 Roman Ayson Road

2600 Baguio City

Philippines

Tel. +63 74 4447703 Tel/Fax: +63 74 4439459

E-mail: tebtebba@tebtebba.org

Website: www.tebtebba.org

Writers: Daisy Bagni; Sr. Guadalupe Bautista, RGS;

Danny Buyagan; Judy Cariño; Alma Goben; Moren S.

Macay; Vicky Macay; Mountain Maid Training Center

(MMTC) Staff; Christy Ngolab; Organisasyon dagiti

Nakurapay nga Umili iti Syudad (ORNUS); Chris

Pukayon; Sr. Alice M. Sobreviñas, OSB; Melchor B.

Tupong

Editor: Judy Cariño

Copy Editor: Raymond de Chavez

Lay-out and Production: Paul Michael Q. Nera

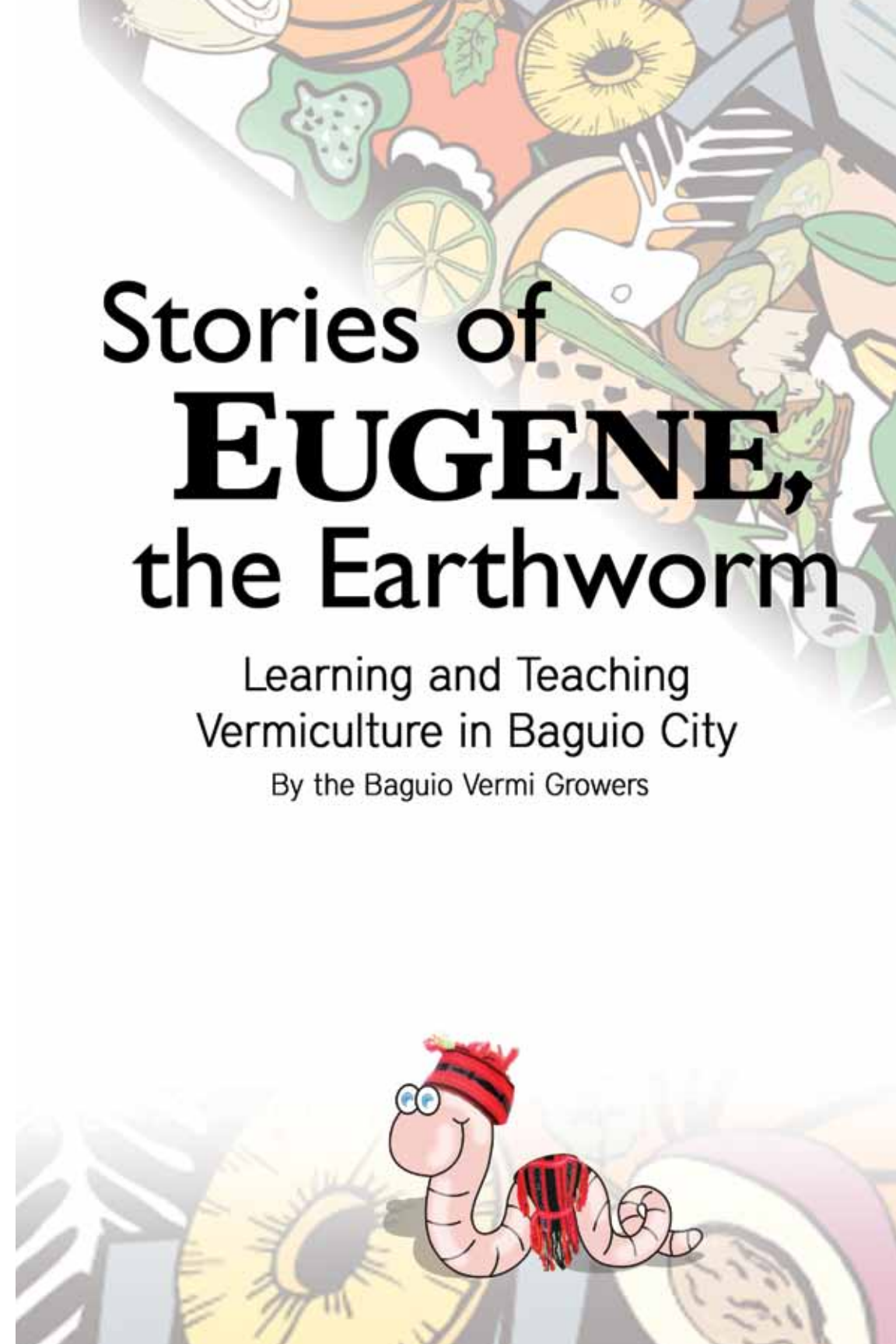
Assistant: Christian Alexander Villaflo

Printed in the Philippines

by Valley Printing Specialist

Baguio City, Philippines

ISBN: 978-971-0186-12-9



Stories of **EUGENE,** the Earthworm

Learning and Teaching
Vermiculture in Baguio City

By the Baguio Vermi Growers



Table of Contents

PREFACE	vii
INTRODUCTION: Learning and Teaching Vermiculture in Baguio City	xiii
PART 1: STORIES	1
My Love Affair with Eugenie	3
Earth Crawlers at Good Shepherd	11
My Friend Eugene	17
The Vermiville	19
Starting with a Handful of Worms at St. Francis Convent	23
Unexpected Friend	27
Experiences of Urban Poor Families on Vermi Growing	31
Family Bonding and Community Sharing with Eugene	33
Helping Mother Earth Brings Peace of Mind	37
My Experience on Vermi Growing	41
Learning to Care for Eugene	45
My Discoveries and Experience with Eugene, the African Nightcrawler	49
Working with Hog Growers	57

**PART 2: A BASIC LESSON IN
VERMICOMPOSTING** 61

**AN INVITATION TO JOIN THE
VERMI INITIATIVE** 67



Preface

*Victoria Tauli-Corpuz
Executive Director
and
Grace Balawag
Climate Change Team, Tebtebba*

Vermiculture, as told in this collection of “Stories of Eugene, the Earthworm,” represents a whole lifecycle of biodegradable waste management that covers composting and green manuring, production of vermicast or vermicompost, and vermi tea used as concentrated fertilizer and pest control, among other by-products. With these vermi products, sustainable agriculture through organic farming is also promoted and further enhanced to produce healthy organic foods in backyard gardens and farms. For some practitioners of vermiculture, the reproduction of earthworms and the vermi by-products are also supplementary sources of income. The production of healthy organic harvests that they can readily use for household food ensures better health for them and their families. They can also sell these produce in the market at higher prices.

The stories in this book present the complete process of doing vermiculture as one of the proven effective waste management techniques for biodegradable garbage. By

processing biodegradable wastes, vermiculture contributes to the reduction of emissions of chemical compounds into the atmosphere. Vermiculture also significantly decreases the biodegradable garbage in the dumpsites, which is one source of greenhouse gas (GHG) emissions such as carbon dioxide, methane and nitrous oxides. These GHGs are the major causes of global warming and climate change.

In relation to urban or rural development planning, one of the present-day challenges for local authorities is how to put in place efficient waste management programmes and strategies. The promotion and implementation of vermiculture is highly recommended as one effective strategy for reusing, recycling and reducing biodegradable wastes. Vermiculture is a practical and an inexpensive solution, which can be implemented by every household or by local communities in cities, urban and rural areas.

Some non-government organizations, religious formations, peoples' organizations and some local government units in several provinces have gone ahead in the advocacy work for waste management, such as vermiculture and composting, among others. Since these are proving to be successful, other local government units and agencies should follow suit. The promotion and implementation of such simple, affordable and more appropriate ways of waste management such as vermiculture, biogas technology and other proven technologies will have more impact if these will be implemented from the household level, then upscaled to cover whole towns, cities and provinces. The achievement of the target of zero biodegradable wastes can thus be easily achieved.

Aside from decreasing GHG emissions, these will also contribute to disaster preparedness and management in localities, which experience flash floods due to irresponsible throwing of garbage that clog drainage systems, creeks and rivers; or land erosions of overflowing dumpsites or landfills, such as what we experienced recently in Baguio City with the Irisan Dumpsite.



Baguio City-based Tebtebba, an indigenous peoples' global institution doing work on sustainable development, biodiversity and climate change, supports this advocacy on waste management through its partners such as the Philippine Traditional Knowledge (TK) Network and the Baguio Vermi Growers. The TK Network and members of the Baguio Vermi Growers have conducted learning exchange visits and roundtable discussions where they shared experiences on indigenous wisdom, knowledge and practices; as well as other practical technologies adapted to respond to daily concerns such as waste management. Waste management is considered as an important area of advocacy, especially as this relates to and reinforces indigenous peoples' values, concepts and practices of waste management in the *ili* (indigenous communities) wherein every waste is reused, recycled and thereby reduced.

Indigenous peoples' values, such as *ayew* (do not be wasteful) among the Kankana-ey Igorot, are the foundation of existing practices of recycling, reusing and reducing what others consider as wastes. Several of us who grew up in the *ili* have been trained to recycle whatever comes from the kitchen for food for pigs and pig manure for fertilizers in our *baangan* (home gardens), *um-a* (swidden fields) and *payeo* (rice paddies). Sharing similar experiences is what happens during learning exchange visits of the members of the TK Network who come from all over the country.

During a learning exchange visit and study tour on waste management technologies conducted in Laguna, members of the TK Network learned and were very much impressed on advanced and readily implementable appropriate technologies and practical solutions to waste management. Whatever they learned in this visit, they have been promoting and implementing in their own communities. These include vermiculture, biogas technology from household and livestock wastes, and other waste management techniques, which are also used for sustainable organic farming and other livelihood opportunities. These are also



being promoted for better health, nutrition and sanitation, as part of the whole life cycle of waste management to food production.

Public awareness and capacity building are equally important to ensure that households and communities are constantly motivated to plan and sustain their implementation of vermiculture, biogas technology and other waste management practices. Getting the local government units and other government agencies to adopt these practices and develop programmes on a wider scale is part of the advocacy work of Tebtebba and its partners. To promote further this advocacy and contribute to raising public awareness on waste management, environmental protection, climate change and sustainable development, Tebtebba supported the publication of this book on the “Stories of Eugene, the Earthworm.”

We, in Tebtebba, and our partners in various countries in the world, including the Philippines, are implementing a holistic approach to sustainable development, which integrates respect and protection of human rights (human rights-based approach), an ecosystem or territorial-based approach, and a knowledge-based and intercultural approach, as well as the development of sustainable local economies. The work we are doing to promote sustainable waste management, sustainable agriculture and biodiversity conservation and sustainable use and climate change mitigation and adaptation are some of the components of our holistic approach.

We hope that the experiences of the Baguio Vermi Growers shared in this book will serve as an encouragement for everyone to also practice these simple technologies on biodegradable waste management. These successful efforts of the Baguio Vermi Growers are a contribution to the reduction of emissions of greenhouse gas emissions for climate change mitigation. Such work is part of our collective contribution to promote environmental protection, sustain-



able agriculture, and the sustainable use and management of resources.

Tebtebba sincerely thanks the Baguio Vermi Growers for their significant voluntary efforts and contributions in sharing their experiences through the stories contained in this book. We also thank the members of the Philippine Traditional Knowledge Network, our colleagues implementing the Programme for the National Implementation of the Convention on Biological Diversity (CBD)—Judy Cariño, Joji Cariño, Len Regpala, Florence Daguitan and Jochebed Caroy, and our Publications staff. We also thank SwedBio for the support they are giving for this programme and Evangelischer Entwicklungsdienst (EED)/Bread for the World for the publication of this book.







Introduction

LEARNING AND TEACHING VERMICULTURE IN BAGUIO CITY

Judy Cariño

Indigenous Peoples and CBD Program, Tebtebba

It was in 2009 when Baguio City's garbage problem reached disaster proportions. The Irisan dumpsite had been filled beyond its capacity, and neighboring communities barricaded the dumpsite and prevented the garbage trucks from entering the area. The city stopped collecting household garbage for weeks at a time, and piles of garbage accumulated in mini-trash dumps in front of our homes and along the streets and market.

Trash was on everybody's mind, and entered into discussions among the Traditional Knowledge (TK) Network.¹ This network had begun discussions on traditional knowledge of indigenous peoples, and how this holds relevance and practical insights for our daily life in Baguio City.

Ayyew is a traditional value of indigenous peoples in the Cordillera, which espouses zero waste. Everything has its

¹ The Philippine Traditional Knowledge Network is an informal network of indigenous leaders and bearers of traditional knowledge.

use, and nothing must be wasted. Each resource is valued; is used and reused in a circle. Ayyew teaches a child not to waste a single grain of rice nor pick unripe fruit, to gather animal feed from kitchen and yard, to reuse kitchen and bath water for garden and chickens, and to gather animal wastes to fertilize the garden. It reminds us to be frugal and wise. Ayyew works well in traditional communities, getting individuals to reuse, reduce and recycle, and provides the motivation for successful household and community waste management.

Members of the network wanted to promote ayyew in Baguio, and decided to help find solutions to the garbage crisis. This was the start of this grassroots initiative, which would later lead to the formation of the Baguio Vermi Growers.

Study Tour to Laguna

In February 2009, nine members of the Traditional Knowledge Network went to Laguna for a study tour on various waste management technologies, ranging from small to big, and from simple to complex.

The Laguna Lake Development Authority (LLDA) hosted us and brought us around to witness good practices and latest technologies in solid waste management. We visited all kinds of material recovery facilities and talked with mayors who were successful in reducing wastes. We were introduced to biogas, vermiculture and sanitary landfills. The mayor of Los Baños told us how he pioneered the ban on sando bags, and showed us how they make outdoor tiles and roofing materials from residual wastes. He explained how political will in implementing local ordinances was the most important in successfully managing their solid wastes.



We visited the Municipality of Bae, where vermicomposting is employed as a strategy in waste management. We saw the municipal vermicomposting facilities, which processed Bae's biodegradable wastes. We talked to local hog growers, who told us that they earned more income from raising worms, than from raising pigs. We learned that these two activities were complementary, as the pigs' wastes serve as the main source of food for the worms. We went to Grasslands in Los Baños, a commercial vermi farm, which produced tons and tons of vermicast, vermicompost, and earthworms, which they sold to farmers and businessmen.

Among all these waste technologies, it was vermiculture that excited the study tour participants, as it was in tune with ayyew. Composting and green manuring has always been part of ayyew, with the recycling of nutrients from organic waste matter into fertilizer for ricefields and home gardens.

Vermicomposting, with the use of certain types of earthworms, upgrades the composting process, making it more efficient and speeds it up. This simple and appropriate technology can transform great volumes of biodegradable wastes into nutrient rich fertilizer, a resource much needed by home gardeners and farmers.

It was here where we met Michael Cagas, who we later invited to conduct a training course on vermiculture in Baguio. Michael is a young entrepreneur and vermiculturist. He built his expertise through many years of focused practice, experimentation, and teaching of vermiculture and vermicomposting in his hometown in Bae, Laguna and beyond. It was through him that we met the African nighcrawler, also known as *Eudrilus euginae*, or Eugene for short.



Vermiculture Training



Michael Cagas gives first vermi training.

On June 13 and 14, 2009, Michael came up to Baguio City to conduct a two-day training for the TK Network. Traveling with him were 30 bayongs (sacks)-full of African nightcrawler earthworms, which were the starter kits distributed to the participants.

Participants came from the urban poor, religious nuns, convent gardeners, farmers, professionals, and NGO (non governmental organization) development workers. For two days, we learned from Michael on how to care for Eugene, and how Eugene can help us in different ways.

We learned about the needs, behavior, mating patterns and lifecycle of the African nightcrawler. It looks like our own native earthworm, in size and color. Unlike the native earthworm, it is flat-bellied, does not burrow in the ground, and prefers to stay on the surface. Thus, this worm is no threat to rice paddies, like the giant earthworms now de-



stroying the Banaue rice terraces. Michael allayed the fears of some participants that this worm would become a pest or invasive species, by explaining that it needs care and protection from pests and predators like chickens, frogs, insects. Thus, they would not be able to survive and thrive, if they are not given the ideal environment and home.

One kilo of worms can eat one kilo of organic wastes in a day, and turn this into vermicast, a superior and nutrient-rich fertilizer. Furthermore, the organic waste is reduced to a fraction of its original volume. Thus, a handful of worms inside a sack, with appropriate bedding materials, can serve as a perpetual bin for household biodegradeable wastes. What can go into the vermi bin? All kitchen wastes, like fruit and vegetable peelings, garden trimmings, banana stalks, sayote; even pig, chicken and horse manure.



Happy to bring home Eugene.

A majority of the 30 trainees were strangers to each other, but soon after the training, became good friends who visited each others' worms, learned from each others' mistakes and successes, and helped each other teach neighbors and friends how to deal with their trash, with the help of earthworms.

Bringing Eugene Home



Outdoor worm bed, Leonila Hill.

My husband and I both attended the training and received one starter kit each, with a total of four kilos of worms to start with. It was during a rainy day when we set up our first vermi bed in our backyard, using available



materials like empty rice sacks, stones, hollow blocks, and composted materials. Under the rain, we set up the bed, improvised some shade for the worms, and collected all the available food in the garden for the worms.

We enjoyed visiting the worms and observing them. We got to know them better. We got excited over their eggs and babies called juveniles, and how large they had grown in so short a time. We learned where the juveniles would gather in the crevices of the banana stalks and how they devoured all the food we placed and how they wanted more. We learned how they were sleepy during the daytime and active during the night. We noticed how some worms went beyond their borders and searched for new homes, maybe because they were getting crowded in their first home, needed more space, and taught us it was time to build a new bed.

Growing Our Own Food

We soon had our first harvest of worms. We made another bed for the mature worms. We also collected vermicast and compost, which inspired us to plant some vegetable seeds, which were almost forgotten on my shelf. We soon had healthy tomato plants and pechay. We noticed seedlings of squash and beans, which we did not intentionally plant but just grew in the beds. All these grew fast and soon bore fruit and were ready to harvest, contributing a good portion to our daily fare. We brought home some herb seedlings from Sister Alice's garden and soon we had goto kola for our brains, citronella to keep off the mosquitoes, lemon grass, dill, tarragon for our tea, thyme and rosemary to experiment with in our kitchen. When we have visitors, we would bring them first to the garden to meet Eugene and to admire and diversity and vitality found in the garden. Thus, it was through Eugene that we got to grow our own food.



The Baguio Vermi Growers

These discoveries gave us reason to get in touch with other vermi growers to share our experiences, and ask them if they had similar discoveries. And getting together was a time for comparing notes on our new favorite topic of discussion. Thus was born the Baguio Vermi Growers, which saw the forging of new friendships among people of different backgrounds, all bound by a newly discovered passion in caring for Eugene and in effect, caring for the earth.

After three years, the vermi growers continue to meet and learn from each other, and also to share our knowledge and experience with others. So far we have conducted more than 20 trainings among communities, convents, barangays, and interested individuals, to introduce Eugene and the benefits this creature brings to all who cares for him.



Advanced training on vermi technologies.



Recently, the Baguio Vermi Growers conducted workshops on advanced vermi technologies. In hands-on sessions, we learned how to produce vermi liquid fertilizers, and how to use indigenous microorganisms to further enhance these vermi products. In the future, we hope to upgrade our production and marketing to make these products available to the public.

This book is a collection of our stories. Here you will meet some of the vermi growers in Baguio. We will follow the story of a few of the 30 bayongs-full of worms and how they multiplied and reached more families, barangays, and even beyond our city to neighboring communities. Let us read their own personal stories on how Eugene made a difference in their lives and continues to touch many other people's lives.

I have to thank Eugene for introducing me to wonderful people, now my friends, who I would never have gotten to know otherwise.







PART

1

Stories





My Love Affair with Eugenie

Sister Alice M. Sobreviñas, OSB

Sister Alice of St. Scholastica's Convent is a most active and energetic advocate for vermiculture, having first-hand experience with the benefits the earthworms bring. Sister Alice played a key role in developing the Seven Healing Gardens of Eden in the grounds of the convent. There they grow marble potatoes, lettuce, beans, pechay, wombok, tomatoes, which are brought to their kitchen for their meals. She says that with vermicompost, the vegetables taste sweeter and more delicious, her harvest has grown, and she feels secure that the vegetables they eat are organically grown, unlike most veggies in the Baguio market.

Sister Alice finds time to share her knowledge about vermiculture to all she meets, to organize trainings, and to teach her gardeners to care for the earthworms and gather the vermicompost. She has been elected as the president of the Baguio Vermi Growers. Her gardens and vermi beds serve as demonstration site for interested people. It is in the Seven Healing Gardens where the Baguio Vermi Growers conduct most of their trainings.



Sister Alice Sobreviñas



I remember a few years ago, Baguio City was full of garbage in almost all corners of the street from my own Barangay Military Cut-off down to the market place. It was a stinking city, no longer the City of Pines. I smelled the foul odor from the garbage instead of the refreshing smell from the pine trees. The piles and piles of garbage in plastic bags were sometimes knocked over and scattered by the hungry stray dogs. It was truly an ugly and repulsive sight.

I asked these questions: What is the government doing about all these rubbish? Why is the city government not keeping Baguio clean and beautiful?

Lucky for us at St. Scholastica's Convent, we have a place where we can compost our garden and kitchen wastes, and bury our non-biodegradable materials. But so many others residents have no space to do so.

There were times when friends would talk with me about caring for worms. And how good they would be for our big gardens. I used to ignore them and whatever ideas they had about worms. For the worms were all "yuck" to me. In our gardens I prefer practicing natural agriculture, which my Japanese friends taught me. Then came Judy Cariño of Tebtebba who was able to convince me to attend the training on vermiculture last June 2009, as a way of effectively managing our wastes and probably of helping solve the garbage problems in the city. Well, why not? And so I did.

My First Attraction

My first attraction with Eugenie was through our guest trainor on vermiculture, Michael Cagas, whom Tebtebba invited from Laguna. When he spoke and introduced the proper care for the worms, he was speaking from his heart. What mattered most to him was having the proper attitude towards the worms named Eugene or Eugenie; to establish



a relationship with them; and to treat them as not separate from oneself, but a part of the self. I was fascinated when he went on explaining that they needed a proper home, a proper bed with proper blanket, and that they must be fed with sufficient food, that they are like a family and a community. That in case of lack of food, they leave their beds to look for food. In case of floods, the matured Eugenie would be caring for their babies, the juveniles, and bring them to safety. They have their own life cycle, and in the process, they multiply themselves and give us their products of vermicast, vermi tea and vermicompost. But like any creatures, they need love, the proper care and sufficient nourishment.

Establishing the Relationship

When it was time for the practicum, I let go of all my reservations about worms. I took hold of Eugenie, felt him in my hand, saw him with my eyes, observed how he moved. He was not repulsive but beautiful, pinkish blue in color, cool and smooth in my hand. Right there and then I promised I would be a very good friend to him and his kin, and that I would see that they are well cared for and loved too by our gardeners.

Deepening the Relationship

An everyday visit to the vermi beds is like saying hello and having my presence felt not only by them but also by my gardeners. Then they know I truly care. And whatever problems arise, they are immediately resolved.



Maintaining their beds with the correct atmosphere and temperature, free from their enemies, and harvesting them on time are essential components of loving them.

In return, the Eugenies, whom Charles Darwin has referred to as organized lowly creatures, are my night workers who do not demand for higher salaries nor have a need for a union. They supply our Seven Healing Gardens of Eden, flower pots, and all the other gardens in the compound with sufficient organic fertilizers. From the original two vermi beds, we now maintain 16 beds, four vermisacks and one worm bin for the office kitchenette. Extra vermifertilizers are sold and/or given away.

Spreading the Good News



A new home for Eugene at Vigan, Ilocos Sur.

Love is shared. Love cannot be contained in itself. It overflows. Through the basic trainings on vermiculture given by the Baguio Vermi Growers, Eugenie's love has spread to so many other religious communities in Baguio, in some barangays, and in the households. They are also now in St. Scholastica's Priory House in Manila and in the monastery of the Benedictine nuns in Vigan. And through some other Benedictine Sisters of the Eucharistic King, they are also now in Mindoro and Dagupan.

My Hope



The Solid Waste Management Division of CEPMO (City Environment and Parks Management Office) join a vermi training.



It is my hope that many more communities in Baguio will come to know, own and love Eugenie. Then our city will be free of garbage. And many flowers will begin to bloom again.

It is my hope that it can spread out to so many other places of Northern Luzon and be adopted by the farming communities. Then perhaps we can contribute in our own little ways to the healing of Mother Earth who, in turn, will heal us.





A PRAYER OF PRAISE AND THANKSGIVING

*How good it is to celebrate God's presence
And to sing His praises each day!*

We celebrate what He has done for us

Through history:

His creation of our world

And the sun and the moon

And the unnumbered stars

That light up our universe;

His creatures that swim and crawl

And walk and fly our planet;

His children destined to enjoy

These great gifts about them.

Whenever one turns,

God's power is manifested,

God's presence is made apparent,

Let us indeed celebrate His presence

In our world today.

AMEN.

*(Adopted from Psalms, Now by Leslie Brandt.
Psalms 147 and 96)*





Earth Crawlers at Good Shepherd

Sister Guadalupe Bautista, RGS

Sister Guada of the Religious of the Good Shepherd (RGS) in Baguio City is happy that their long-standing problem of garbage has now been solved. Good Shepherd is famous for its Mountain Maid brand of ube jam, adobo peanuts, strawberry products, and cookies and such, which visitors line up for. Truckloads of ube, peanuts, strawberries and other produce, are processed into yummy goodies, proceeds of which go into an educational support program. Meanwhile, their composting efforts were not able to keep pace with the volumes of wastes produced. Thus, they used to have a compost heap, which kept growing and growing.



Two of their staff, Jun and Christopher, attended the first training and received six kilos of earthworms. They made their first vermi beds, and started feeding them their accumulated organic wastes. Their earthworms thrived, multiplied and produced vermicompost, which they applied in their gardens. Their initial success encouraged them to make more vermi beds and transform their previously ornamental gardens into vegetable gardens. A next step is to introduce vermiculture to their farmer-suppliers of strawberries, to encourage organic farming among them.

Now, RGS effectively manages its wastes, and their experience has made them into staunch advocates of vermicomposting for solid waste management and organic farming.

Context

Baguio's dumpsite in Irisan reached its breaking point three years ago (2008). The dumpsite collapsed. The people of Irisan protested against dumping the city's trash in their barangay. Dump trucks were blockaded. This forced the city government to haul its basura (trash) to a sanitary landfill in Tarlac, which costs millions of pesos.

Tourists remember the time when Baguio was considered the "greenest and cleanest" city. Not anymore. Trash along the road remained smelly and uncollected. There were attempts at segregating garbage designating certain days during the week for garbage collection. The problem remained. The situation became critical.



Response to a Crisis

To lessen the garbage the city collected, we sorted our garbage into white paper, colored paper, cardboard boxes, cans, glass, bakal (metal, steel, etc.), plastic, mineral water bottles, etc. It is true that “there is money in trash.” We sold the sorted garbage and put aside the money for our Fund for the Poor. Later, the fund was for scholarships.

To lessen the use of plastic bags in our store, we ordered cloth bags with the message printed “One less plastic bag,” “Hindi ako plastic (I am not plastic).” We switched from non-biodegradable plastic bags to biodegradable plastic bags, which costs more. We stopped using styrofoam cups for coffee and juice. Instead, we used paper cups, again more expensive.

Our initial attempts at composting organic wastes from the canteen, kitchen and production area did not succeed. We lacked the know-how and staying power.

African Nightcrawlers

Thanks to Sr. Alice, OSB, who invited us to a seminar on vermiculture in 2009, we were introduced to the composting worms also known as the African nightcrawlers. We were able to send two of our staff to this seminar. The Baguio Vermi Growers was born and has since gone from strength to strength.

African nightcrawlers are voracious earthworms. They eat up all our organic wastes and give us 60 sacks with 40 kilograms each of vermi cast every month. We use this to fertilize our flower and vegetable gardens and our blueberry farm in Atok.



What a blessing these small creatures are. We praise our Creator God for making these tiny earthmovers our partners in the mission to preserve planet earth.

Vermi 101, the Good Shepherd Way



Paying a visit to Eugene at Good Shepherd Convent.

Materials/Equipment Needed

1. Shredder – Choose one that fits your volume and capacity. At Good Shepherd, we started with a 3-horsepower shredder, fuelled by gasoline. Later, we switched to a 5-horsepower shredder, using electricity.
2. Pressure hose to clean shredder after every use. This is run by electricity.
3. Shed to house equipment and to protect it from rain.
4. Hollow blocks to surround vermi beds.



5. Shed to protect vermi beds, preferably screened to prevent birds from feasting on the vermi.
6. Rubber gloves to separate baby vermi from full-grown vermi.
7. Empty sacks to put vermicasts.
8. Several kilos of worms as starter.
9. Organic wastes from the kitchen, e.g., banana peelings, sayote peelings, papaya, strawberry stems, ube peelings, even egg shells.
10. Organic materials from the garden, e.g., leaves, banana stalks, weeds, etc.

We started with six kilos of African nightcrawlers. These were fed with shredded wastes from production and the kitchen. Because our organic waste is wet, we allow this to decompose one week before feeding to the worms.

When we started, we did not have a roof and when it rained the vermi escaped or drowned. The birds used to come and feast on the worms until we screened the vermi house.

Vermi are fed every two weeks.

Harvesting of vermicast is done once a month. Baby worms are separated from fully-grown worms so that they do not fight for food.

Vermicast will contain eggs and these will hatch where you apply the vermicast in the garden.

If you sell vermicast, it is better if you sieve it to get fine “black soil.” No need to sieve for home use.

Vermicast is used to make vermi tea. We have a commercial brewer and a homemade one learned from a hydroponics workshop.







My Friend Eugene

Arsenio Pinus-an
Mountain Maid Training Center (MMTC) Staff



Wombok at Good Shepherd, fertilized with vermicompost.

First of all, I would like to thank the Good Shepherd Sisters for giving me all the opportunities to learn about Eugene, and to participate in the activities of the Baguio Vermi Growers. God bless!

Everything in this world has its purpose, like my friend, Eugene, the worm.

It is us, humans, who take many things for granted. The reaction of many of us in meeting Eugene is “yucks!” Honestly speaking, I was one of those who reacted this way before. Later on, when I befriended Eugene, it was a big awakening to me. I began to realize and understand the tremendous importance of Eugene. Eugene may be small, a seemingly insignificant creature, but the importance of its silent underground work is as big as the world. Oh, how I give thanks to you, my friend, Eugene. You have developed in me the value of self-discipline, proper waste segregation and caring for our surroundings.

Eugene’s work has never been as vital as at present. Everywhere, like in our city, we cannot deny the fact that we are facing a very grave garbage problem. This problem challenged the Good Shepherd Community and in response, we involved everyone in the practice of the 3Rs – REDUCE, REUSE and RECYCLE, and set up vermicomposting. We built a vermi house where my friend, Eugene, lives for comfortable processing of vermicast. We use a shredding machine, which is an essential tool for the primary procedure wherein all the segregated biodegradable wastes are shredded. Up to the present, the Good Shepherd Community continues to maintain and care for my friend, Eugene, because its work is best for waste management. It is also a big help to garbage collectors who pick up only the segregated non-biodegradable waste.

Finally, I have welcomed my friend, Eugene, into our home where it serves as our household waste management worker.





The Vermiville

Danny Buyagan



Danny Buyagan ang Daisy Bagni.

I live at a monastery located at No. 100 Rosaryville, Marcos Highway, Sta. Catalina Compound. When we adopted Eugene, we built him a home, and called it Vermiville, upon the suggestion of Father Fermin.

Sister Alice invited me to attend a basic training on vermiculture. I belong to the third batch of trainees. From the lectures and hands-on training, and later, from sharing experiences with other vermigrowers, I was able to learn the procedure on how to take care of Eugene. But on the first time I saw Eugene, I had different emotions and uncomfortable feelings. At that time, I was afraid to touch and hold Eugene, not like in my childhood when we used to play with bugs and worms. During the training, I learned a lot. I learned that Eugene can help reduce the waste problem here in Baguio. It was during this time that our garbage remained uncollected and caused hazards to health and to the environment. From this training, I got one kilo of worms and started vermicomposting. I made a big box made of hollow blocks for them to stay. I fed them based on the lecture and St. Alice's instructions. The food came from our kitchen and garden wastes, like vegetables, fruit peelings, grass from the garden, and dry leaves of trees. I fed these to Eugene.

At first, I harvested only the fertilizer for the garden, for our flowers and medicinal plants (given by Sister Alice). Earlier, I did not yet collect the vermicast and vermi tea because of some problems in our set-up. A month later, Sr. Alice with her assistant visited to check if everything was fine. Sister gave me tips and instructions on the right way of feeding, managing their space, and collecting vermi tea and vermicast.

As Eugene grew, I encountered some problems like ants, maggots, rats, and flies, which kept me busy keeping them free from pests, and caused a lot of tedious work in separating the vermicast, every time I harvest. This is why I put screens to provide protection from the pests. Also, I learned during the seminar to use rice washing. Every time



I wash the rice, I pour the “arasao” on the bed. I observed positive effects on Eugene and the control of smells from the worm bin. Lately, our next problem was where to find more sources of worm food, as Eugene has grown and multiplied, and wastes from our kitchen cannot sustain the growing worm population any more. So I cut a branch of banana and chop it into small pieces to augment their food.







Starting with a **Handful** of **Worms** at St. Francis Convent



Melchor B. Tupong



Melchor Tupong writing his story.

I learned to care for Eugene when I attended the basic vermiculture seminar in Tublay, Benguet, in December 2009. This training session was organized for the victims of Typhoon Pepeng, and I was invited to join.

Sister Alice, Rey and Judy Cariño taught us the importance of composting with the use of worms. Since I do composting in our convent without the help of Eugene, I had a question mark in my head: Why is Eugene necessary? As the seminar went on, I was a bit convinced of the usefulness of Eugene. And when the seminar adjourned, I said to myself: Yes I will try it.

First, I started in a small sack because I had only a handful of worms. Then, I made an elevated bed, where I put all our kitchen waste ready for decaying. After a few days, the waste started to decay, and so I transferred the worms from the sack into the elevated bed. As our worms grew in number, I made more elevated beds of different sizes. As of today, we are maintaining five beds in our backyard garden.

I decided to use elevated beddings because our place has many pests, such as rats, ants, and birds. For me, elevated beds have many advantages: It is easy for me to monitor the worms, easy to feed them, easy for demonstrations, and easy to gather vermicompost and transfer the worms.

For food or substrate, I use kitchen wastes, cut grass, leaves, especially sunflower leaves. These waste materials are cut into pieces then put into containers to be partially decomposed. When these materials are on decomposing stage, this is ready to be used as food for the worms. I usually feed Eugene every weekend. Sometimes, I feed them when I see that their food has been consumed.

For maintenance, I usually monitor the worm beds every day to see if there are any pest invasions. I also like to communicate or talk with Eugene to give us good vermicompost. Monitoring is important so that I can see to it that the worm beds have the right level of temperature, sufficient moisture and food.



Usually, it takes around two to three months before we gather vermicompost. During harvesting, we gather the vermicompost for use in our garden. Sometimes, I harvest the fully-grown worm breeders and transfer them to a new worm bed.

In my encounters with Eugene, I have learned that vermicomposting needs patience, understanding, and a commitment to care for the environment. In St. Francis Convent, we have learned and experienced the importance of segregation of wastes into biodegradable and non-biodegradable; of composting the biodegradable wastes; and the valuable help that Eugene gives in managing our wastes and in reducing bad odors in our backyard.

To the Baguio Vermi Growers: Keep up the good work, and share the good news to others.







Unexpected Friend



Christopher Pukayon

In the year 2008-2010, I was a part time working student in Good Shepherd, Baguio City. Sister Alice of St. Scholastica's Convent sent an invitation to the RGS sisters to attend the 2-day seminar about vermi composting and waste management, on June 13-14, 2009.

At that time, the Good Shepherd Community was experiencing a problem of waste, especially biodegradable waste, because the city government stopped collecting garbage. Because of the foul odor produced by the biodegradable waste that affected the production area and customers, Sister Guadalupe Bautista sent two workers, Kuya Jun and I, to attend the training.

In my first day of attending the training seminar, Michael Cagas, the resource speaker, said that our topic was about earthworms that would help us with our garbage

problem. There was a very big question mark in my mind. This was because the earthworm is a big problem in our province, Ifugao, because they destroy our rice terraces. The discussions went on, and I tried to understand; it then came to my mind that “I will try” to see and believe. After the seminar our certificate was the vermi starter kit, which contained Eugene. Each of us had starter kits of two kilograms of earthworms. But Kuya Jun and I were lucky to get six kilograms.



Chris Pukayon

Caring for Eugene at Good Shepherd

We started caring for six kilograms of Eugene. We put the worms in three beds. Each bed contained two kg of Eugene. We fed them with combined shredded peelings of ube, banana leaves, kitchen waste, and other biodegradable from the production area. After 45 days, Eugene multiplied. We set aside the small ones and the bigger ones. We made three more beds and we put the bigger ones with the same substrate or food in our first three beds. After a month, we observed that the beds should be harvested, so we harvested earthworms and vermicompost. That was the time that I began to believe that Eugene is a friend of the earth and also of us, humans. So we continued caring for Eugene until we had 35 beds. Each bed contained two kg of earthworms and one sack of vermicompost. I observed that there was a big impact in helping the community of Good Shepherd.

Because of Eugene, the biodegradable wastes continuously became less smelly, and these no longer affected the production area and the customers. The biodegradable wastes turn to vermicompost and vermicast. We used the vermicompost in the garden. We planted vegetables, like pechay, cabbage, Chinese cabbage, squash, ampalaya, etc. And it is very effective and resulted in healthy plants and vegetables for us. Vermicompost has a great contribution in caring for our gardens, and we should use this instead of chemical fertilizer. We used the vermicast in brewing vermi tea, which is a good foliar fertilizer.

There are also problems that I observed in caring for Eugene, like the pests such as rats, frogs, birds, and red ants. But there is always a remedy, like destroying the homes of the ants, and daily monitoring so that the rats and frogs would go away from the beds. Another remedy is to cover the beds so that the birds will not eat the worms.

Caring for Eugene at St. Scholastica

On April 4, 2011, I was hired as a gardener at the Seven Healing Gardens of Eden at St. Scholastica's Convent.

After one month, I started caring for 3.5 kg of Eugene. I put them in four beds. The two beds contained one kg each, and the other two beds contained $\frac{3}{4}$ kg each. After 21 days, I pre-harvested the beds that contained $\frac{3}{4}$ kg breeders. I transferred the breeders to another bed. My way of feeding Eugene is different from what I did before in Good Shepherd, because here at St. Scholastica, there is no shredder. So what I do is I chop my substrate like banana trunks, dry leaves, grasses, sunflower and other biodegradable materials, before feeding these to Eugene.

Using vermi compost and vermi tea in the garden brings great benefits to us humans and our Mother Earth, because it will not destroy our land, but instead helps preserve it. We care for Eugene and also try to convince others to also care for Eugene for the sake of our Mother Earth.



Experiences of Urban Poor Families on Vermi Growing

*Organisasyon dagiti Nakurapay nga Umili iti Syudad
(ORNUS)*

ORNUS, as an alliance of urban poor organizations, has been part of the Vermi Growing initiative since the first training in June 2009. In its effort to help in the reduction of waste in the urban poor sector, ORNUS has adopted vermiculture in its campaign. With the Traditional Knowledge Network, ORNUS through its limited capacity has conducted trainings and orientations on vermi growing in urban poor communities. With the orientations that it conducted, and with some individuals who got interested to get worms for their household, we share some of their experiences on vermi growing. Three members of ORNUS (Christy, Alma, and Daisy) share their stories in the following pages.



Sharing worms in Irian.





Family Bonding and Community Sharing with Eugene



Christy Ngolab, Quirino Hill

I am Christy G. Ngolab from Tapao, Quirino Hill, Baguio City. I am a community organizer of ORNUS. I was among the first batch of trainees in vermiculture, and I was assigned to attend the training as our official representative to the Traditional Knowledge Network and the Baguio Vermi Growers. I am one of the first ORNUS members who started vermi growing just after the vermiculture training I attended in June 2009. Our trainor was Michael Cagas from Laguna. Each of us trainees received a starter kit with two kgs of worms. I brought home my starter kit, and set up our household vermicomposting. At the moment, I now have six kilos of worms. This is aside from the more or less 20 kilos of worms that I have shared with some neighbors and those that I sold during vermi trainings and during the Panagbenga festival in March 2011.

I use empty rice sacks as my worm bins. The two kgs of worms I brought home were distributed into four sacks. The worms multiplied until I had 20 vermisacks. I also put two adult vermi in my flower pots and herbal plants. Food for my vermi are all kinds of biodegradable wastes from the kitchen and leaves of all kinds of plants in our yard. We include banana stalks for their food during summer because the worms like their beds to be cool.



Christy Ngolab, Quirino Hill.



What we do with their food is we put the biodegradable wastes in one container to rot before feeding them to the worms. At first, we put our waste directly on the beddings but I observed that it takes longer time for the worms to eat fresh food than rotten food. Rotten food are easily eaten by the worms.

Feeding and visiting are done every morning. We also check if there are insects or pests in the beds. Sometimes, we visit their beds at night only to find out that many worms are on top of their beds and are busy eating. When lighted, the worms try to hide under their food. That's why the worms are called African nightcrawlers, because it is during the night that they are active, and they get busy when put in dark areas. When in bright areas, they hide in darker parts of their beddings.

Harvesting is done after every 45 days. We separate the adult worms and place them in other sacks. The vermicast and vermicompost is harvested every two months.

My husband and I are tasked to do the harvesting while our three children help in feeding the worms.

I was able to share Eugene with other members of my family (sisters and cousins) and also in our community. We initiated a basic vermiculture training for the women in our barangay in West Quirino Hill in April 2010. It was attended by 16 participants. This way, I was able to share with others the wonders of knowing Eugene through my experience. I regularly visit the vermi beds of my neighbors and I have discovered some improvised and better ways of caring for Eugene. However, there were some who were not very successful in vermi growing.

We in ORNUS promote vermiculture in the urban poor communities as one solution to the garbage crisis and a way to enhance our backyard gardens. Coordination is needed when there are scheduled vermiculture trainings. We also have to plan on how to convince people on the role of Eugene in waste management. In our experience, not eve-



rybody welcomes the idea of vermi growing immediately. This is sometimes frustrating, but we do not tire of conducting orientation sessions and convincing the urban poor to start vermi growing to be able to help solve the garbage problem of Baguio City.





Helping Mother Earth Brings Peace of Mind

Alma Goben, Quirino Hill

Alma was a participant of the vermiculture training conducted in Quirino Hill in April 2010. She was issued one fourth kilo of worms, which she brought home. She uses “sako (sack) technology.” In April 2011, we visited the worms of Alma and I was amazed by how she cares for her worms. She has four sets of sako put in a shaded area in their yard. In the first sack are her new kitchen biodegradable wastes that she feeds the worms when they no longer have food. In the second is a vermi sack with decaying wastes. On the third is also a vermisack with vermi compost and on the fourth is a vermi sack with vermicast. Alma says she transfers the substrate from one sack to the other sack to be refined until it becomes pure vermicast. Asked why there are plastic in one of the sacks, she showed how the vermiforms separate the non-biodegradable from biodegradable waste. The worms eat the paper, leaving the plastic, which

Alma gets and includes in her weekly garbage, brought out to be collected by the city. Below the sacks is a cardboard box, which the worms eat when they no longer have food in the sack or if they get out of the sacks.

Alma wrote, "My Eugene lives in a sack with beddings of banana stalks and golden bush leaves, with their food from the peelings of vegetables and fruits. Above it, I put soil to prevent fruit flies flying around the sacks. Everyday I put peelings of vegetables and fruits. Eugene worms are very happy with rotten fruits and left-over food. Every month, I transfer adult worms to new beddings."

On her observations and experiences with Eugene, Alma writes, "Eugene fills up my time. When I'm bored and alone, I open a sack and count them one by one, which brings peace of mind. I know that I am helping Mother Earth by reducing garbage because they even eat paper, which is a big reduction to the piles of garbage carried by the garbage collectors. Aside from that, my children learned the importance of garbage segregation. Eugene smoothens my hands even if I already washed my hands with soap and water."

Problems? "My problems get buried in the soil."

She has already sold and shared some of her worms. She was able to sell worms to one of her visitors who visited them and got interested in the worms.

Questions? "Can these worms be fed to tilapia and milk fish?"

Yes, they can take the place of fishmeal, and are an excellent source of protein and nutrients for all kinds of fish. They can also be fed to poultry.

ORNUS has included vermiculture as one of its advocacies in 2009. It seemed easy at first when the campaign was at its conceptualization period: "reducing and segregating waste at the household level" and "enhancing segregation and backyard gardening with vermiculture." However, in the trainings conducted in urban poor communities, the



idea of vermi growing was not that acceptable, as the urban poor women perceive the worms as pests. It seems that it is even more acceptable to the professionals and middle class families compared to the poorest women.

Currently, we are still on our campaign on vermi growing. There are still few urban poor families who now practice vermicomposting in their homes. But we do not tire in spreading the good news of the wonders that Eugene has done and the future wonders it will do at home and in the environment. It is taking a very slow pace but a steady one that can still become a mass movement in the future.







My Experience on Vermicomposting

Daisy Bagni

Sto. Tomas Proper, Baguio City

I remember the volumes of uncollected garbage in the streets in the Central Business District and even in our barangay. Many barangays, including our own, posted “No collection of garbage.” At home, we had to dig a shallow pit for our biodegradable kitchen wastes. It was a blessing that Judy Cariño of TK Network, and Michael, a trainer on vermiculture, visited our office, and conducted an orientation on vermi growing and its big role on waste management. It was then that we in the urban poor sector were introduced to Eugene or the African nightcrawlers. Around 15 of us who were present in the orientation each got a handful of vermi worms for our homes.

Vermi Growing

Having in mind the convincing stories of Michael, Judy and Christy, I first started with a tray where I put my worms, which served as our garbage bin for some months. Below the tray is a wide plastic to collect the vermi tea. For some months, the tray had been enough for our garbage bin, but later on I asked my brother to make a vermi bed where we transferred the worms. All our daily biodegradable kitchen wastes, including paper, go to the vermi bed. The feeding is done daily or even twice depending on the wastes.

I did not strictly follow the schedule for aeration and harvesting. It was enough for me to check if the worms were still in the bed. Usually harvesting is done every three months or even five months. Because it takes long before the next harvest, there are seedlings that grow on the bed such as avocado, mango and pepper. We were able to transplant the three pepper seedlings, which now currently supply us, our neighbors, and even friends who visit us.

There was a problem of pests such as rats for some time. Ants are always on the vermi bed but they are not a hindrance for the worms to multiply. For the flies, we get sunflower leaves to cover the bed to control the flies. During summer, we take turns in sprinkling water on the vermi beds. There are times that we get banana stalks for the worms, especially during the dry months.

Impact on the Household

Ever since I brought home the handful of worms, we only have non-biodegradable wastes brought to the city garbage collection. Everybody in the house now has their own time for monitoring the worms. Although it took several months or maybe a year before the others at home got



interested to take a look at the worms. Now, they are all involved in the harvesting and monitoring of the bed and the worms.

Among the observations that we had at home was that the plants which grew in vermicompost are very healthy and very green.

I usually share worms with interested individuals, and I already shared more or less 20 to 30 worms each with five of my friends. Last February 2011, I was able to sell two kgs during the Session Road in Bloom to interested passersby who have already heard about the important role of the voracious African nightcrawlers.

My story is not worth telling. As I reflect on my part as a vermi grower for almost two years, I do not have much to share. It is just that despite the previous typhoons in 2009 until the present, the worms are still there processing our kitchen wastes, thus a 100 per cent non-biodegradable kitchen waste brought to the city collection. I do not know if many of them ran away, but the handful of worms I got two years ago has multiplied into many handfuls, and has been shared with others. With this, I can say that I did not abandon them and they also have not failed me, haha!







Learning to Care for Eugene



Vicky Macay

I have participated in meetings and seminars in many organizations, and I have learned so much, especially on the struggle of indigenous peoples for the recognition of ancestral land rights. I am fortunate to have been invited to join the cross visits to Luzon, Visayas and Mindanao, where I learned many things and broadened my knowledge. Through these activities, I got to know many people from many different places, and shared our stories. I'm happy and get joy from these invitations of Tebtebba in meetings and seminars on indigenous peoples' rights.

Then in 2009, we were blessed to meet our helpful and wonderful friend, Eugene, the worm. The first time we met Eugene, it was yucky to us. *Ngaraniyay jen kodangat?* What is this worm? Yaks! *Kasanon ekuan mo'e khajem mo eyay jen kodangat?* How can you say this worm is your friend? When

many worms can be found crawling on the ground and do nothing to help. But then we got to know that Eugene is really very different from an ordinary earthworm, hehehe, and that our friend has a foreign name “African nightcrawler” and a male name “Eugene,” ha, hay wonderful!



Vicky Macay

My son Moren was invited to a seminar regarding this African nightcrawler and he got interested in it. Then there was a continuous flow of invitations for meetings and seminars on vermiculture. I also got interested, and I started to take care of two kilos of worms. I put the worms in a sack. Then, I collected the kitchen waste (nabubulok/decaying) for their food. Feeding them in a sack, I saw that they were getting plenty and they ate so much and so fast. So I had to add the leaves of my plants to their food. When they be-



came many in number, my son and I made a bed for them, so again, we had to add more food. Aside from the kitchen wastes and leaves of my plants in my backyard, I also collected sunflower and looked for cow and horse manure for their food.

It's a big help that instead of throwing or burning our kitchen wastes and the leaves of my plants like before, I now collect them for Eugene's food. I'm thankful that Eugene has come to our home. Now that they have become many, they produce vermicast which is fertilizer for my garden. Every morning, I always go and see them because I have learned that rats eat them. I collected fertilizers from Eugene's waste and use it for my plants in my backyard garden. First, what I planted was sayote and with vermicast fertilizers, it bore many fruit. So I continued to plant beans, gabi, pechay and flowers, too. Now I have enough fertilizers as well, for my papaya and malunggay seedlings, and many others.

Eugene, our friend, is not at all an ordinary earthworm.

On April 29, 2011, indigenous women friends and visitors from Asian countries came to our house, and I was so happy and welcomed them. We shared stories about our culture and experiences. After a while, I was asked to share about Eugene. So I demonstrated how to set up a vermisack by putting Eugene in the sack with beddings, how to feed them, how they look like, the difference between Eugene and the ordinary earthworm, and what to do when they become many.

How did I meet these women from different indigenous communities from Asia, Latin America and Africa? With the love and blessings of God, I have been fortunate to join many activities. I'm glad I have met Eugene, my friend, who is the reason why I have met many interesting people, and why we formed our group, the Baguio Vermi Growers.

God said, "Let the land produce living creatures according to their kinds: livestock, creatures that move along the ground and wild animals, each according to its kind (Genesis 1:24)."







My Discoveries & Experience with Eugene, the African Nightcrawler

Moren S. Macay



Hands-on interaction with Eugene for CEPMO and hog growers.

Having a friend like Eugene is really a blessing. It is a friend, a worker, and a business partner rolled into one. I came to know Eugene when I joined the study tour to Laguna on waste management technologies, organized by Tebtebba in February 2009. After a few months, I attended the first seminar on vermiculture in Santa Scholastica's Convent. Our teacher was Michael L. Cagas who is a well-known vermiculturist in Laguna. After the training, I received my starter kit with two kilos of African nightcrawlers (ANCs).

I decided to set up a vermisack for my friend Eugene. There are many kinds of bins but I preferred to use the sack technology because my time to set up my vermi bin was short. I just let my worms crawl into the sack and eat banana stalk for several weeks. However, a group of ants attacked my ANCs until one day, my ANCs all crawled out of the sack because of the ants. I decided to make a second bin, which I elevated to protect my ANCs. However, after a few weeks, I discovered other pests in the vermisack. I saw centipedes eating the eggs of my ANCs, and also a rat was torturing and eating my ANCs. In two months of caring for Eugene, only half a kilo was left of the two kilos of worms that I had brought home.

I was trying to think of some strategies to solve the pest problem, when Michael, our vermi trainor, invited me to spend the summer in Laguna, and to learn more and on-the-job about vermiculture. Before I left for Laguna, I asked my mother to take care of the remaining ANCs.

On my first day at Bae, Laguna, I met Atong, Michael's worker who manages the whole vermiculture area or bulatehan. The bulatehan had 200 vermi beds, with 10 to 20 kilos of ANCs in each bed. Most beds are made out of sacks, tarpaulin and hollow blocks, measuring 2-5 meters in length. There are also bins made from destroyed drums. I watched how Atong managed the entire area, and there I saw the proper attitude of caring for the ANCs. Atong told me how the ANCs are fed; what are the proper things to prepare before going to visit the beds; what the ANCs need; and most important of all, not to use tap water from



NAWASA (a local water utility company) in watering the vermi beds. Next day, we went out riding a motorcycle and I was amazed when I saw that almost all households in Bae, Laguna have vermi beds.

In Laguna I received hands-on training on vermiculture. I learned how to solve the problem with ants through the use of vermi organic pesticide. Here is a list of pests and predators of worms that we have to guard them from: birds, ants, rodents, centipedes, mites, toads, crickets, kamaru, lizards, termites, Japanese beetles, and leeches. As Michael said, compost worms are not subject to disease caused by microorganisms, but they are subject to predation by certain animals and insects (red mites are the worst).

I learned about toxic components, like detergent cleaners, industrial chemicals and pesticides, which can kill my worms. I learned about a disease known as “sour crop” or protein poisoning, which happens when the worms are overfed and too much protein builds up in the bed, and produces acids and gases toxic to the worms. I learned about the right temperature and the right stocking density in building a worm bed. I learned a lot that first summer 2009 which I spent in Laguna learning more about vermiculture. I came back to Baguio to continue my schooling.

The next summer, Michael again invited me to Laguna, and I grabbed the opportunity to learn more. This time, I learned from two vermi companies: Grasslands under Sir Joey and Green Wrigglers under Michael Cagas. This time, I learned that vermiculture does not only produce fertilizers, but also other organic products, like EM2 (Deodorizer and Composting Agent), EM3 (Foliar Fertilizer), and EM4 (Nemitocidal Agent and Surfactant). These biotechnologies make use of vermiculture products and I learned how to make and use such products.

I’m very thankful that even though I am an Information Technology student, I have been given the opportunity to gain much knowledge as a vermi grower.



After my second training in Laguna, I was able to understand and appreciate the contributions and impacts made by vermiculture in the area. Just like Baguio, Laguna has to solve their garbage problem. Sixty per cent of the garbage collected in the market, malls and households are biodegradables and the remaining 40 per cent are plastics and residuals. They use vermicomposting as an effective strategy to reduce their biodegradable wastes. The main purpose of composting is to reduce the amount of solid waste. Composting is highly encouraged as it cuts the trash by at least half and recycles the organic wastes and enriches, restores and replenishes the topsoil with valuable nutrients.

As we traveled through the province, I observed that vermiculture is being practiced in the urban center and also in the farms. It is practiced widely in Bae, San Pablo, Santa Cruz and other municipalities, where you can't find a cluster of 100 houses, which do not have vermi beds. Farmers, businessmen, professionals and also the poorest of the poor are worthy of caring for the ANCs. Many engage in vermiculture as their main livelihood and others do it for a secondary income.

In Laguna, many are aware of the benefits that vermiculture brings. This awareness is slowly growing in different areas of the Philippines, and we in the Baguio Vermi Growers (BVG) are actively promoting vermiculture here in Baguio City and other areas in the north. BVG promotes vermiculture for waste management and also for organic farming in neighboring Benguet province by conducting seminars and trainings for those interested.

One thing I would like to share in order to be successful in vermiculture: you have to adopt the worms as your friends and not to treat them as toys, which you can just throw away if you get tired of them. Remember that you have adopted the worms and so you have the obligation to take care of them.





Worm beds in Loakan.

I have now learned to take care of Eugene in a proper way, to make their beddings, to feed them and care for them. In return for my work and sacrifices, they give me sacksful of vermicast and vermicompost. These have high and diverse microbial and enzymatic activity, good moisture-holding capacity, and contain nutrients such as NPK (nitrogen phosphorous and potassium), Ca (calcium) and Mg (magnesium) in forms readily taken up by plants. They contain plant growth hormones and humic acids, which act as plant growth regulators.

I have applied vermicompost in my garden and have seen the great results on papaya, corn, sayote, citrus, frog grass, and malunggay. Vermicompost increases the level of plant nutrients and beneficial microorganisms, which have the ability to stimulate plant growth, suppress disease and repel pests. I have also decided to set up a nursery at home, where I grow seedlings of papaya, malunggay, potato tree, mango, and different flowers and medicinal herbs like rosel.





Propagating fruit trees with vermicast.

I now have 11 beds. Some have 15 kilos of ANCs and the others have 10 kilos. As my worm beds grew in number, I was able to sell eight kilos of ANCs to my friend Carlos Balalong, which I delivered to Kasibu, Nueva Vizcaya. In Kasibu, I was able to look around the backyard of Carlos and I instructed him on how to make a bed for the worms. In his backyard, I noticed that some of the plants were destroyed by pests, so I introduced an organic pesticide, making use of vermi products.

Here is a shared story of Carlos Balalong:

“Since I bought ANCs from my friend Moren, I was able to provide and sustain the needs of our citrus farm, which has 40 trees. I was able to make an organic pesticide for ants, white pest like cotton, frog and graspers, etc. The ANCs are also providing my mother and grandma compost for them to fertilize the cabbage, carrots and other vegetables.”

On my way to Kasibu to deliver the ANCs, there was a passenger who asked what were inside the wooden crates. I gave him a short introduction to the ANCs’ uses for com-





posting and organic farming. I also gave them my calling card. After a few weeks I received a call from someone named Freddie, who was the son of the interested passenger on the trip to Kasibu. He was interested in visiting the vermi beds, and he came to our house in Loakan. After the demo and beginner lectures, they decided to buy 15 kilos of worms.

I am really lucky having ANCs. My advocacy is to promote vermiculture in our city and beyond, not just to earn an income but as a citizen of Baguio who deserves a healthy living environment. The joy of sharing my vermiculture experience with others is a great gift that God has given to me. I'm deeply grateful and honored to be a part of the Baguio Vermi Growers. Vermiculture offered me the opportunity to contribute to the promotion of organic farming as an alternative to chemical agriculture. I share the journey with people whose simplicity and generosity of heart inspire me to accompany them in the advocacy to promote vermiculture. I thank Eugene for letting me understand the importance of organic agriculture, food security and healthy living. Thank you!







Working with Hog Growers

Judy Cariño

One problem that urban vermi growers meet is the lack of source of food for the worms. At an early stage, household kitchen scraps, paper and other biodegradable waste can support several vermi bins. However, when we wish to set up more bins for the growing population of worms, the limiting factor is the worm food.

In this regard, urban hog growers are lucky, since they have unlimited source of worm food, which is hog manure. Often a source of pollution, urban hog growers can turn their wastes into a resource, once they learn and adopt vermicomposting as their method of waste management.

Bal Kiat-ong was a hog grower, who joined the first training in 2009. With practice and experimentation, Bal perfected his vermi system, which used fresh hog manure as the main source of worm food. He maintained enough worms to consume the daily wastes produced by his pigs.



Introducing Eugene to hog growers.

He noticed a great reduction in the foul smell of the piggens. And interestingly, it was Bal who was the fastest in multiplying his worms. Starting with two kilos, he soon had tens of kilos of worms to share or sell, which he offered whenever the group would conduct a training session. Again, when members of the BVG started to set up a vermi farm in Loakan, Bal contributed the most number of



worms. We concluded that hog manure is an ideal substrate for Eugene, especially when multiplying them is the main objective.

Though Bal has left for a job overseas, we share his story whenever we meet hog growers.

One day in 2011, some staff of the City Environment and Parks Management Office (CEPMO) came looking for us. They heard of the work we were doing, and invited us to a Water Dialogue in Barangay Pacdal. It was in this meeting that we met the hog growers of Maria Basa.

Sixty families of indigenous Bayyo migrants have settled in Maria Basa along the Sagudin Creek, where about a third of these families engage in the traditional occupation of hog growing. This activity allows them to continue to practice the age-old rituals during such milestones as births, weddings and deaths, as it provides them with the necessary animals to butcher during these occasions. However, hog manure is unprocessed and is dumped into the Sagudin creek, which flows into the Balili River. This pollution adversely affects the families in Maria Basa and those who live downstream the Sagudin creek, which flows into the Balili River.

In June 2011, CEP MO presented findings on the quality of water on major inland water resources, particularly on the Sagudin creek in Barangay Pacdal. It was revealed that in tests of the water quality in the city waterways, it was in the Sagudin creek along Maria Basa where the highest polluted samples were collected, with a biochemical oxygen demand (BOD) level of 1965mg/liter as compared to an ideal value of 5mg/liter.

When informed of these findings during the Water Dialogue in June 2011, the Bayyo community committed to do their part and make efforts to reduce the pollution from their pigpens. During the dialogue, we presented vermiculture and biogas technologies as possible solutions. The hog growers were eager to learn more about vermicomposting,



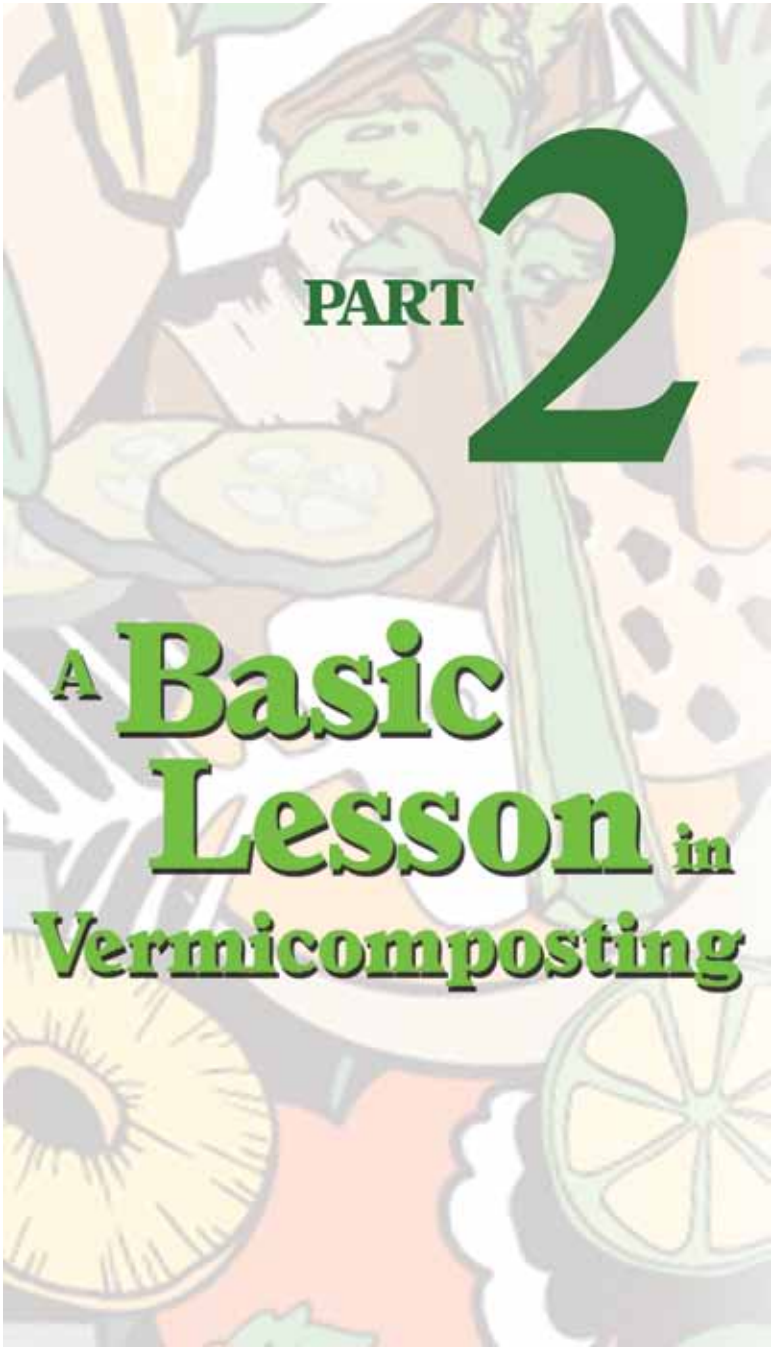
as it is simple and low cost, as compared to biogas technology.

On August 10, 2011, the Baguio Vermi Growers conducted a Basic Vermiculture Course for 17 hog growers in Baguio. As a result, the participants learned how to set up and maintain a vermicomposting system in their households, which would help process the pig manure into vermicast, which is a premium organic fertilizer. Participants received starter vermi kits, which would enable them to practice vermicomposting in their backyards, thus lessening the pollution of Baguio City's waterways. This training was done in partnership with CEPMO.

In recent visits to Maria Basa, we have learned that many of those who joined the basic training have been successful in multiplying their worms, and are now starting to manage their wastes properly.

We recommend that CEPMO continue to help promote vermicomposting among hog growers, and among all households and communities, so as to reduce the volume of garbage that Baguio City produces.





PART

2

**A Basic
Lesson in
Vermicomposting**

Before buying a verмикит and attempting to set up a vermi bin, it is important to learn basic facts about earthworms, and how to care for them. We have met people who tried to raise worms, without benefit of training, and many times, they were not successful in caring for the worms.

This section includes some information to get you started in household vermicomposting. However, everyone is encouraged to attend a Basic Vermiculture Course for Households conducted by the BVG, to benefit from sharing of experiences with other vermigrowers, and hands-on interaction with Eugene.

Vermiculture is the culture of worms. There are 5,000 species worldwide and more than 400 species in the Philippines. Some worms live and burrow underground and feed on soil, like our own native earthworm. Others, like Eugene, are surface dwellers, and feed on organic matter on the ground. They are also known as compost worms.¹

One compost worm that has proven to be most suitable to Philippine climate and conditions is *Eudrilus euginae* or the African nightcrawler, which we fondly call Eugene. Eugene eats compost, and thrives on the soil surface. It looks like our own native earthworm, in size and color. Unlike our local worm, it is flat-bellied.

Those of us who care for Eugene are eager to tell others of vermiculture, because this technology is low cost, simple and based on science. It is quite easy to successfully practice vermiculture, if we remember some basics. So what exactly does Eugene need?

First, Eugene needs a place to live, with a hospitable environment, usually called a vermi bin. There is a whole range of vermi bins, using various materials. Depending on your resources, space and available materials, you can design your own vermi bin. Most of us use recycled and available materials in our homes like rice sacks, hollow blocks, or wooden pegs and laminated sacks. Some are outdoors

¹ Rafael D. Guerrero III. Agribusiness Week. July 6, 2010.



and open to the elements, while others have built roofs to shelter their vermi bins. A pigpen or a seedling nursery can be transformed into worm bins, like what was done at St. Scholastica's Convent. A vermi bin can also be located indoors, just make sure that liquids from the vermi bin are collected.



Sako technology, Quirino Hill.





Stackable bins, Maryknoll Sanctuary.

A second requirement is bedding which is made of materials that provide stable habitat, are absorbent and maintain moisture, and allow circulation of air. Some examples are banana stalks, twigs, horse manure, dayami, dry leaves, corrugated cardboard, coconut husks, fruit and vegetable peelings.



Recycled plastic containers, apartment building in Fairview.





Worm house, Dontogan.



Former pigpens, St. Scholastica.

A third requirement is a source of food, also called substrate. This includes all organic materials (nabubulok), such as hog, chicken, cattle manure; pre-composted food scraps, garden wastes, cardboard, paper, egg shells, and many others. Eugene has a voracious appetite and one kilo of worms can eat a kilo of food everyday.

Fourth, worms need adequate moisture. During the dry season, there is a need to water the vermi bin, to maintain ideal moisture content. However, be sure to maintain good drainage to avoid flooding.



Fifth, the vermi bin needs adequate aeration. Worms need oxygen. Bedding should not be densely packed, and should allow ventilation. When the bed gets too compact, then it is time to dig around gently to allow air to circulate.

Lastly, worms need protection from extreme temperatures. Guard against overheating. During the summer, it is good to locate the vermi bins in some shade, like under the trees.

The worms need care and protection from chickens and birds, ants, rats, frogs, lizards, termites, centipedes, and white grubs.

Vermiculture has a number of products, which a grower can benefit from.

If you scrutinize your vermi bin after a week, you will discover that there are eggs and baby worms. When these mature after a few more weeks, you will be able to harvest earthworms, which you can share with your neighbors, or sell to those who wish to start vermicomposting.

Look closely again into your bin, and you will see small dark pellets which resemble coffee grounds. Those are the worm excreta, called vermicast. After harvesting the worms, the material left in your bin is vermicompost. Both vermicast and vermicompost are proven to be premium organic fertilizers, which you can use in the garden. These are valuable for those of us who wish to grow our own food, and green up our environment.

One great benefit from vermicomposting is knowing that you are doing something concrete to lessen the garbage that needs to be brought to the dumpsite, and in a small way, contributing to the reduction of greenhouse gas emissions, and mitigation of climate change. All these come from caring for Eugene.

Eugene says, "Join the Vermi Initiative! You've got nothing to lose but your garbage."



An Invitation
to **Join**
the **Vermi**
Initiative



Each of us can reduce our household wastes by more than half, and contribute to a long lasting solution to the Baguio garbage problem. In the process, we can produce vermicast, high quality fertilizers for our plants and gardens. You are invited to join the Vermi Initiative for your own wellbeing, for your neighborhood, for Baguio City, and for Mother Earth.

More than two-thirds of the wastes produced by Filipino households are biodegradable, usually consisting of kitchen and yard wastes. If these biodegradable elements can be dealt with at source, at the household and community level, we will contribute to the reduction of garbage that needs to be transported to dumpsites or landfills.

In 2010, the city reported collecting 284 tons of garbage per day. After the trashslide at the city dumpsite, which killed five people in August 2011, there is still no clear long-term solution to the garbage crisis.

A viable solution to the city's garbage woes can be shouldered partly by each individual, each household, and each neighborhood. This is an invitation for you to do your share and join the Vermi Initiative now.

How Do I Start?

First step is to segregate your biodegradable wastes from recyclables and residuals. This organic matter can be treated and processed into fertilizers.



What is Vermicomposting?

Vermicomposting refers to the process of using earthworms to turn organic wastes into vermicompost, a high quality natural fertilizer and soil conditioner.

In the Philippines, the most suitable composting worm is *Eudrilus euginae* (Eugene for short), also known as the African nightcrawler, which is a voracious processor of organic wastes. Weighing just a gram each, they can eat the equivalent of their weight in organic material. It has a high reproductive rate and can thrive in a wide range of environments that duplicate its ideal living conditions.

A handful of earthworms can be placed in a sack with appropriate beddings, which can then serve as a perpetual bin for your organic wastes. Soon, your kitchen and yard wastes will be transformed into rich humus for your garden, or a lucky neighbor's.

How Do I Join the Vermi Initiative?

Do join the Vermi Initiative by attending a 3-hour basic training course on vermicomposting, which is conducted by members of the Baguio Vermi Growers. You can also purchase a vermi starter kit, which contains a handful of worms and bedding, and which you can immediately start to use as a perpetual bin for your kitchen and yard wastes.



Baguio Vermi Growers

The Baguio Vermi Growers is a local group, which aims to develop homegrown solutions from the grassroots to the garbage crisis in Baguio City. We promote the process of vermicomposting as a simple and effective way of managing household kitchen and yard wastes, thus contributing to the reduction of wastes that need to be hauled to the dumpsite or landfill. We work to popularize vermiculture and vermicomposting in Baguio City as a household activity, which is sustainable, eco-friendly, and enjoyable.

We offer the following services and products:

- Training on Vermiculture
- Consultancy
- Visits to our demonstration sites
- Vermi starter kits, vermicast, vermicompost, vermi tea, vermi liquid fertilizer

For more information, please contact the following:

baguiovermigurowers@gmail.com

Sister Alice Sobreviñas, OSB
St. Scholastica's Convent
Baguio City
442-4755

Judy Cariño
Tebtebba
444-7703

Christy Ngolab
ORNUS
55 Ferguson Road, Baguio City
09197714064





More than two-thirds of the wastes produced by Filipino households are biodegradable, usually consisting of kitchen and yard wastes. If these biodegradable elements can be dealt with at source, at the household and community level, we will contribute to the reduction of garbage that needs to be transported to dumpsites or landfills.



ISBN 971018612-4



9 789710 186129